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Can Student Assistants Effectively Provide Chat Reference Services? Student Transcripts vs. Librarian Transcripts

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Abstract

To determine if undergraduate student information desk assistants were effectively staffing the library's chat reference service, librarians at Bowling Green State University embarked on a chat transcript analysis project, comparing the performance of librarians to student assistants. Though student desk assistants generally did not perform as well as librarians, it was concluded that with a renewed emphasis on continual oversight and training, students were a very viable option for staffing a chat reference service.

Talk abounds in the academic library realm about the shifting roles of librarians. While it was once an accepted norm that an academic library should have a professional librarian staffing a reference service point, reference librarians now often find themselves needing to justify time spent at the reference desk. Reference service hours are being cut or reference assistance is by appointment only. In many cases service points are being combined. And for years now, reference services have been offered by non-librarians, including paraprofessionals, graduate students and even undergraduates. Academic libraries are all making adjustments in this ever-changing environment to perform their best with the resources available.

Reference and instruction librarians at Bowling Green State University (BGSU) have also been struggling to determine how to adjust services to best meet the needs of students and faculty within their current staffing situation. This library has a long history of employing undergraduate student assistants to work at the main reference desk, but they were serving in what was considered a supporting role. Librarians worked alongside the students most hours that the desk was open, and the students answered directional, technology related and easy reference questions, while the librarians handled the complex reference questions. When a chat reference

service was instituted in 2000, student information desk assistants were naturally included in staffing the service. Reference staff monitored the chat service while working at the reference desk, and as student assistants staffed the desk on their own late in the evenings and on weekends, they were also responsible for answering questions that came in through the chat service. Additionally, it was expected that the chat medium would be a venue for quick informational and known item requests rather than involved research questions, so it made sense to have student assistants answering what was thought would be the easier questions. In fact, student assistants were designated to be the primary responder to questions received via chat when both a librarian and student assistant were at the desk together. The librarian could monitor in-progress chat interactions, and the student assistant could easily transfer more difficult questions to the librarian as needed.

Over the years, the department made many adjustments to its reference staffing model as the roles and expectations of the reference librarians shifted. As librarians retired or pursued new opportunities, vacated positions were not all being filled. Due to reduced staffing, librarians were being asked to take on additional responsibilities. In light of changing librarian roles and also the steady decline of reference questions, various reference staffing options were explored, all of which decreased the time that librarians spent at the desk, and thus decreased time librarians spent staffing the chat reference service. Student assistants were staffing the desk and chat service an increasing number of hours without librarian supervision, and reference staff began to question the wisdom of this practice.

It also became evident some time ago that the chat questions received were not in fact the quick, easy informational questions it was first thought they would be. A high percent of the questions

received via chat were research based, often complicated and challenging. The student desk assistants were handling a lot of involved research questions and probably not consulting or transferring to a librarian as frequently as they should. Reference librarians started questioning whether student assistants should be the “first responders” to chat questions and even whether they should be answering them at all.

Periodic review of chat transcripts uncovered cases of low quality service offered by student information desk assistants, but the students also conducted many very high quality chat interactions. Taken as a whole, were the student assistants doing a good enough job answering patrons’ chat questions? To be fair, there was also much variation in the quality of chat transactions offered by reference librarians. It was questioned whether student assistants were offering an effective and acceptable quality of service, but how exactly did their service compare to that provided by librarians? Understanding the effectiveness of the student assistants, in comparison to professional librarians, in answering questions received at the reference desk (in person or via chat) would be extremely valuable. Tough decisions were being made regarding staffing reference services and any solid data that could be gathered to help inform those decisions was needed. The authors had access to the chat reference transcripts and decided it would be informative and worthwhile to take a deeper look into the effectiveness of the student information desk assistants in comparison to librarians. Of course, how the student assistants answered in-person questions was also very important, but the existence of chat transcripts provided a unique opportunity to study the quality of this type of reference service.

Literature Review

Best practices for staffing reference services has long been debated in librarianship. Chu (1997) argued that only professional librarians should provide reference service to ensure high quality. This sentiment was also common in the results of Brunsting's (2008) survey on reference desk staffing. At the same time, there have been many critiques of a librarian-staffed desk, particularly following the national trend of declining reference transactions. Stevens (2013) outlined decades of challenges to a librarian-staffed reference desk (including its very existence) and many libraries have utilized alternative staffing models where paraprofessional staff, graduate students, and/or undergraduate students participate as chat providers. These tiered reference staffing models allow for greater efficiency in an age of declining reference statistics and competing demands on librarian time (Brunsting, 2008; Faix, 2014; Stanfield & Palmer, 2010). In a survey of over 100 librarians, Banks and Pracht (2008) found that 62 percent of libraries use non-degreed personnel at their reference desk. In another large survey, Brunsting (2008) found that in medium sized academic libraries, 41% use support staff at reference desks and 34% use students. There have been few studies that employed transcript evaluation as a tool to determine the quality of service based on provider status, primarily in relation to librarians versus paraprofessional staff. In some cases, results of transcript analysis have concluded that chat reference should be handled by professional librarians (Morais & Sampson, 2010). Graves and Desai (2006) identified that librarians were more likely to provide instruction during chat transactions than paraprofessional staff (87% to 74% respectively). A study of NCKnows, the state-wide cooperative chat project in North Carolina also examined chat performance based on provider status (Pomerantz, Luo, & McClure, 2006). Their service was staffed by academic

librarians, public librarians, and chat service staff. They found similar accuracy across provider classes, but that librarians were more likely to engage users. Ultimately, they concluded that professional staff are well-suited for providing chat reference.

Despite being listed as an emerging staffing trend for front-line reference (Gremmels, 2013) the use of undergraduate students in reference service is infrequently documented in the library literature. The limited research on undergraduates as reference providers led Bodemer (2014) to declare that perhaps, "the objections to undergraduates were deemed so obvious that nobody felt compelled to spell them out" (p. 168). Early research on students as reference providers discussed co-staffed services with students serving as the buffer between users and librarians (Heinlen, 1976). Early research also indicated that students could be competent reference providers able to answer most common reference questions (Heinlen, 1976; Young, 1970). More recently, Faix et al. (2010) concluded that the use of undergraduates for peer reference is not only a successful model, but may be the optimal approach to reference services. Bodemer (2014) also proclaimed the appropriateness of employing undergraduates in reference and instruction based on the inherent skills they have developed in the information age, the changing functions of library services, and the value of peer learning. Other studies have shown that a large proportion of transactions at physical reference desks are directional or short research questions that can be effectively answered by students or nonprofessionals (Bracke et al., 2007; Ryan, 2008). White (1985) traced the history of students as employees and also identified the different philosophies toward their role, from expeditors of library services to primary providers of services as unofficial colleagues.

There is also research and discussion around the role that undergraduate students should have in reference services. White (1985) traced the history of students as employees and also identified the different staffing philosophies, from envisioning student assistants as expeditors of library services to primary providers of services as unofficial colleagues. At Cal Poly Pomona student assistants, (termed LibStARs), refer any research question beyond a simple title search (Stevens, 2013). Librarians at Rowan University struggled to agree on the extent of reference service their undergraduate reference assistants should provide, noting that it was the most difficult component of implementing the peer model. (Brenza, Kowalksy, & Brush, 2015). At the University of Southern California, student assistants were trained in general databases that could meet the needs of most in-person research questions (Gardner, 2006).

The use of undergraduate student assistants in reference services has not always been successful. Following the introduction of a learning commons, Fitzpatrick, Moore, and Lang (2008) detailed the transition at the University of Massachusetts Amherst from a tiered model to a librarian-only staffed desk with positive results. Also, demands on librarian time and expanded hours of availability has lead libraries using the tiered model to increasingly rely on student assistants to work without a reference librarian present as originally envisioned (Faix, 2014; Mitchell, Comer, Starkey, & Francis, 2011). At Coastal Carolina University, the expansion of their peer reference model included weekly training activities, including subject specific databases, although ultimately departmental reorganization and shifting staffing led to a major revamping of their reference service model and a decrease in the complexity of questions student assistants were expected to field (Faix, 2014). In a 2009 survey of academic librarians, Stanfield and Palmer (2010) found that 97% indicated that their student assistants provide directional service, 67% of

their student assistants provide catalog and/or database searching, 39% assist in article searching within databases, 21% answer citation questions, and only 10% assist with source evaluation and recommendation.

There is less research on undergraduate students as virtual reference providers, which is perhaps unusual given that chat reference service has been a continually growing component of academic library services. Chow and Croxton (2014) note that online chat has the highest satisfaction and usability ratings among university students. Ward and Phetteplace (2012) found that chat reference was the dominant method of reference assistance, both in time spent and interactions, during their review of reference desk staffing. Virtual reference services are also accounting for a growing proportion of reference transactions and could potentially reverse the decline in reference statistics (Stevens, 2013). The lack of literature on student assistants as virtual reference models may be due in part to staffing models. Several libraries that utilize undergraduates at their reference desks specify that only librarians staff their chat services (Curtis & Greene, 2004; Davidson & Mikkelsen, 2009; Fennewald, 2006). However, some institutions have documented the use of student assistants in chat reference. At California Polytechnic State University San Luis Obispo, undergraduate student assistants (termed LibRats) are involved in both reference and instruction services, including chat reference (Bodemer, 2014). While there was not formal assessment of their reference service quality, reviews of chat transcripts indicate that the LibRats were "knowledgeable and congenial" (p. 171). At Kansas University, student assistants contributed to staffing a local chat service to increase hours of availability. Using undergraduates for peer chat reference was considered problematic as they required significant training, had high turnover, and did not always refer appropriately (Devlin,

Burich, Stockham, Summey, & Turtle, 2006). Ultimately, the use of student assistants was discontinued and KU joined a Cooperative chat service. When Coastal Carolina University expanded their peer reference model they included their peer reference assistants in their chat service, following a model similar to the in-person reference desk where students refer difficult questions to librarians (Faix, 2014).

Methodology

Before the performance of librarians could be compared to student desk assistants regarding chat reference service, the authors needed to decide how to evaluate the quality of the chat reference transactions. Specific measures and indicators were needed to complete the evaluation. In 2012, one of the authors, in the position of Reference Coordinator, created a chat transcript evaluation instrument for use in a professional development activity. This evaluation tool was also used in a 2013 chat transcript study. Having found the instrument to be effective, it was decided to use the same tool, with a few minor adjustments to help fix previously-identified trouble spots. When originally developed, a literature review was conducted and aspects of many different evaluation tools were combined, but the author borrowed most heavily from an ACRL presentation on collaborative assessment (Beers, Gaspar, & Palacios-Wilhelm, 2001), as well as Luo's (2008) framework on chat evaluation, and the evaluation form used in a former, now defunct regional chat consortia.

The authors analyzed 300 chat transcripts to be included in this study, 150 transactions conducted by student information desk assistants and 150 by professional librarians. Transcripts completed by full time staff (non-librarians), paraprofessionals or graduate students were omitted from the study. The 300 transcripts were then drawn from those of all eligible providers,

including eleven librarians (426 transcripts) and seven students (651 transcripts). The authors were also careful to include a fairly even number of transcripts from each individual (librarian and student) to eliminate any individual overrepresentation. Finally, in order to keep the 300 sample size robust, easily-identified, problematic transcripts were eliminated. These included prank questions, quickly dropped chats, extremely brief directional questions, and student assistant/librarian collaborations.

A concerted effort was made to norm the use of the evaluation instrument. The two authors discussed their understanding of each item on the evaluation tool and then completed two rounds of practice evaluations. Each author rated the same transcripts individually and then compared their ratings, discussing any differences, and taking notes for later reminders. When comfortable with a shared understanding, each author completed 150 transcript evaluations (75 from librarians and 75 from student assistants). The authors did not evaluate transcripts of their own chat reference service. During the evaluation period, the authors touched base periodically in an effort to better ensure they were using the same evaluation standards.

All transcripts were rated blind, having been stripped of identifying information. The authors did not know the identity of the reference provider or whether the provider was a librarian or a student. The authors evaluated different transcripts for the study and felt reasonably confident regarding the consistency in which they applied the established rubric. However, the authors acknowledge that there is a degree of subjectivity involved with some of the questions, particularly those in which quality was assessed (ex. Rater's Overall Impression on a five point scale from Poor to Excellent).

The chat transcripts that are embedded throughout this article are actual transcripts; however, edits have been made for anonymity and clarity. Some transcripts have been greatly condensed, having removed portions that are not relevant to the point being discussed. Care was taken in the editing not to misrepresent the chat transaction.

There are limitations to this study. It represents findings from a single institution, and the strengths and weaknesses of this chat reference service may not necessarily compare to those of other libraries. The authors do include findings from other studies throughout the results to provide the reader additional context for comparison. This study relies on a small sample of chat providers, and the authors did not have a method to compensate for individual performance. Within this one institution, there is variance between the performance and experience of individual chat operators, both with students and librarians. At the time of the analysis, there were both experienced and less experienced librarians and a similar mix of experience was present with the student assistants. In addition to the above, other minor limitations are addressed throughout the analysis.

Findings and Discussion

Question Types

The first question on the transcript evaluation instrument was not evaluative in nature, but rather just asked the rater to record the transaction type. The category options were: Directional & Quick Referral, Questions about Technical Problems, Ready Reference/Specific Search, Library Policy or Service, Known Item Search and Research Question. The chat transactions were defined at a higher level of specificity than just a broad division between Directional and

Reference. This division would allow for analysis of the difference between librarians and student desk assistants for reference questions involving varying skill levels.

Table 1 details the types of questions that were evaluated in the 300 sample transactions. The table shows that there is a similar division of question types between the librarians and student assistants except for within the *research question* category. *Research questions* accounted for 43% of the questions that librarians answered compared to 35% of the questions that student assistants answered, indicating that librarians responded to more questions typically requiring a higher skill level. This is not an unexplainable result. When both a librarian and student are logged into chat at the same time, librarians might respond first when evident by the initial user question that it is a research question. It is also common practice for the student assistants to transfer difficult or challenging questions to an available librarian.

Table 1
Chat Questions by Transaction Type

	Librarians	Students	All
Directional & quick referral	2 (1 %)	3 (2%)	5 (2%)
Questions about technical problems	17 (11%)	14 (9%)	31 (10%)
Ready reference/specific search	18 (12%)	22 (15%)	40 (13%)
Library policy or service	21 (14%)	27 (18%)	48 (16%)
Known item search	28 (19%)	32 (21%)	60 (20%)
Research question	64 (43%)	52 (35%)	116 (39%)
TOTAL	150	150	300

As shown in the final column of Table 1, the majority of the questions examined would be considered reference questions as opposed to directional or informational questions. While the lack of standardized classification of transaction types complicates comparisons, other studies

have also documented a mix of transaction types dominated by reference and research questions (Avery & Ward, 2010; Houlson, McCready, & Pfahl, 2006; Marsteller & Mizzy, 2003; Maximiek, Rushton, & Brown, 2010; Zhuo, Love, Norwood, & Massia, 2006). In fact, in this analysis the most common transaction type was *research question*, which accounted for 39 percent of all questions. Most research questions involved searching for articles on a specific topic. The “questions about technical problems” which accounted for 10 percent of questions, frequently involved users experiencing problems accessing electronic resources. The other categories are self-explanatory.

In the sample used, only two percent of the total questions were classified as *directional & quick referral*. As stated earlier in the methodology, some directional questions were purposefully eliminated from inclusion as they do not allow for much evaluation, which would indicate that directional questions were underrepresented. However, when consulting the library’s reference statistics for the same time period, directional questions indeed comprise a low percent (7 percent) of the chat questions received in 2014 (see Table 2).

Table 2
Questions by Type: Chat Compared to In-Person Questions

	Chat	In-person
Directional	7.2%	36.3%
Equipment	1.8%	14.0%
Reference	91%	50%

BGSU users do not consider the chat format a method for only asking brief, straightforward questions. Reference staff record all user interactions at the reference desk by the question types Directional, Equipment, or Reference, which do not directly parallel the question type categories

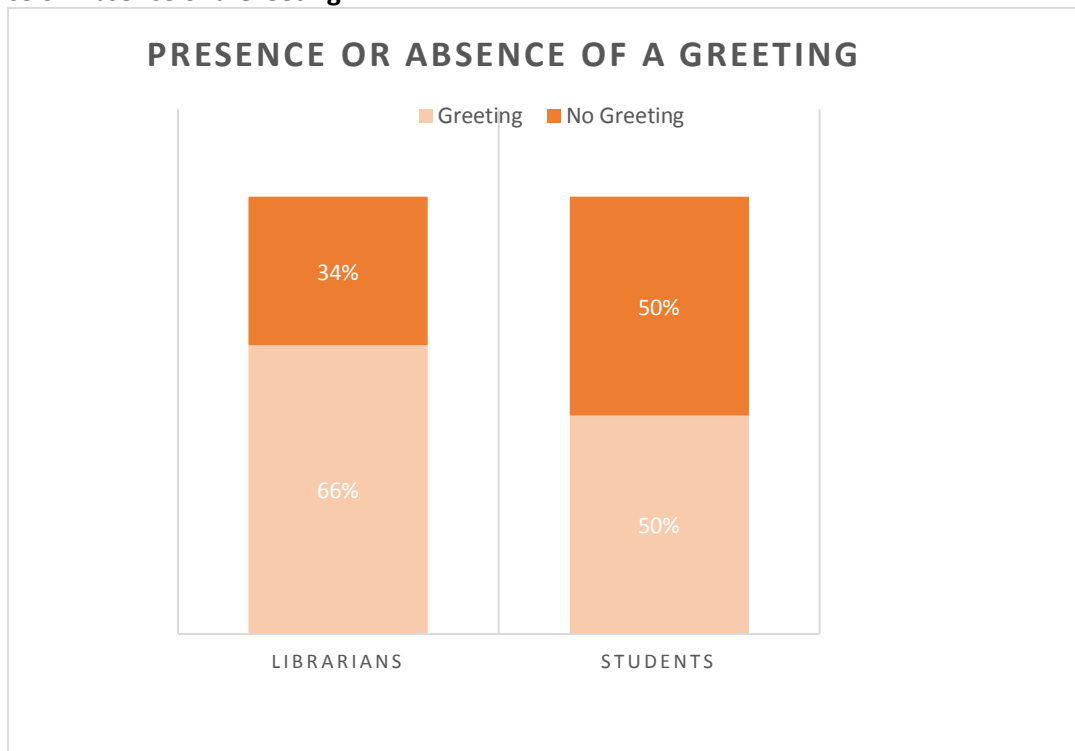
used in this transcript analysis. However, it is worth noting that reference statistics for 2014 indicate that 91 percent of chat transactions were categorized as reference questions compared to just 50 percent of in-person transactions.

Greetings & Closings

Offering both a greeting and closing are generally accepted best practices when providing chat reference. For the second question on the evaluation instrument, the authors simply recorded the presence or absence of a greeting, not rating the quality of the greeting, but rather just indicating that one was present even if it was a simple hello. Librarians were more likely to offer a greeting (66%) than the student desk assistants (50%). See Figure 1.

Figure 1

Presence or Absence of a Greeting



Should chat providers always use a greeting? If so, then neither librarians nor student assistants are coming very close to meeting that goal. During the time these transactions occurred, the authors were advising all chat providers to use a greeting as a best practice, but did not require a standard greeting for all or stress its importance.

One reason for not requiring a greeting was that it did not seem necessary or even appropriate in every situation. The authors believed that in some transactions, the lack of a greeting was not a negative. When a chat user asks a straightforward library hours or policy question in their opening statement, it is arguably preferable to just offer a quick answer. In their transcript analysis, Zhou, Love, Norwood, and Massia (2006), also concluded that the absence of a greeting did not impact quality of service.

The authors also reviewed each transcript for a closing statement. The possible choices were “No closing”, “Basic Closing”, “Closing with confirmation that question has been answered and/or with offer to return if needed” and “Chat ended abruptly; no chance to offer closing.” The third option (Closing +) is undoubtedly the best practice and included closings such as:

- You are welcome! If you need more assistance please don't hesitate to ask.
- You're welcome! Anything else I can help you with today?
- Great. Have a good semester. Come back anytime you have questions.

This type of extended closing was used 31 percent of the time by librarians and 25 percent by student assistants (See Table 3). It is interesting to note that though librarians were slightly more likely than students not to offer a closing, 15% to 11%; they were also more likely to offer a strong closing 31% to 25%.

Table 3
Presence or Absence of a Closing Statement

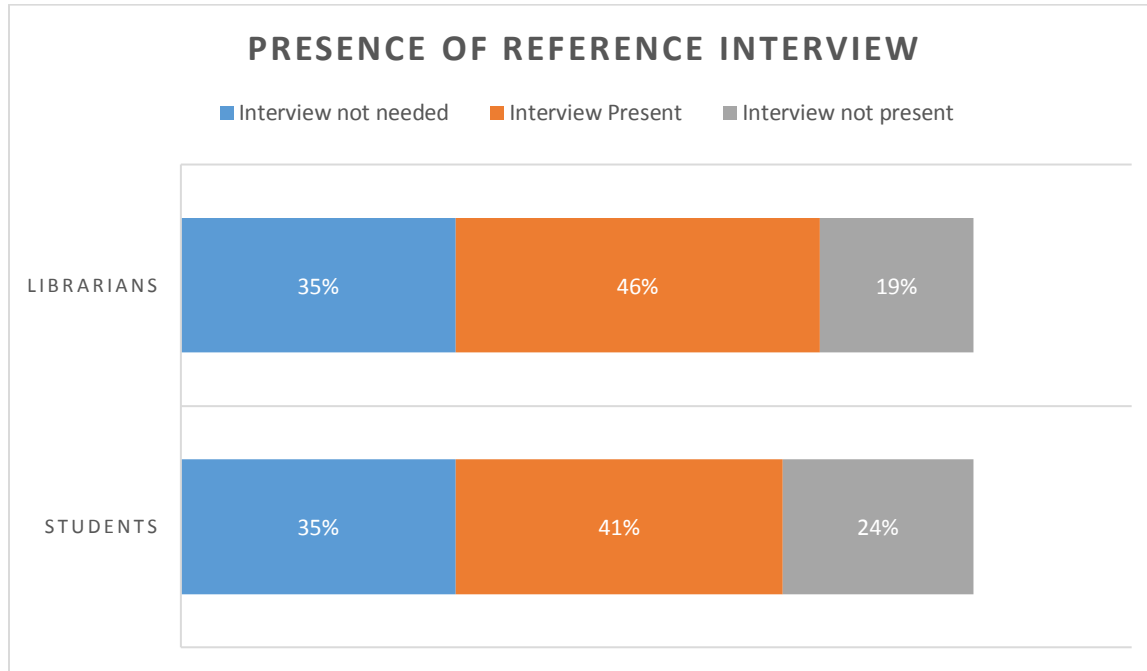
	Librarians	Students
No closing	22 (15%)	17 (11%)
Basic closing	64 (43%)	87 (58%)
Closing with confirmation that question has been answered and/or with offer to return if needed.	46 (31%)	37 (25%)
Chat ended abruptly; no chance to offer closing.	18 (12%)	9 (6%)

Reference Interview

Conducting a reference interview in the chat environment can be challenging, but often critical to the success of the transaction. For each transaction, the authors recorded the presence or absence of a reference interview. The three options were: *A) Not applicable/needed*, *B) No interview*, and *C) Yes, Interview present*. No attempt was made to judge the quality or length or completeness of the reference interview. If the chat provider asked for clarification or any type of question, option *C) Yes, Interview present*, was selected.

For 35 percent of the transactions (same percentage for both librarians and student assistants), the authors judged that a reference interview was not applicable or needed. If a chat user asked how late the library is open to pick up a book being held at the circulation desk, there is no reason to conduct a reference interview, and it was coded as *A) Not applicable/needed*. Thus when the authors selected option *B) No interview*, they were indicating that the interaction would have been improved by a reference interview. These results are summarized in Figure 2.

Figure 2
Presence of Reference Interview



Librarians were more likely than students to conduct a reference interview, but not by much (69 vs. 62). These results were somewhat surprising, as it was expected that librarians would conduct reference interviews far more than student assistants. Previous studies have documented reference interviews at varying rates. Hyde & Tucker-Raymond (2006) identified that in applicable transcripts 64.7% contained reference interviews. Similarly, Marsteller and Mizzy (2003) found that 64% of analyzed transcripts contained reference interviews. Radford, Connaway, Confer, Sabolcsi-Boros, and Kwon (2011) found an even higher figure of 74%. BGSU librarians did not ask clarifying questions in 29 of the 98 of the transactions in which the raters judged an interview was needed. The student assistants were even less likely (36 of 98) to negotiate the question. Why would this be? Would this finding be the same if analyzing

transactions at the in-person reference desk? The authors speculate that the nature of the chat environment makes it more likely that the librarians and student assistants would skip the reference interview.

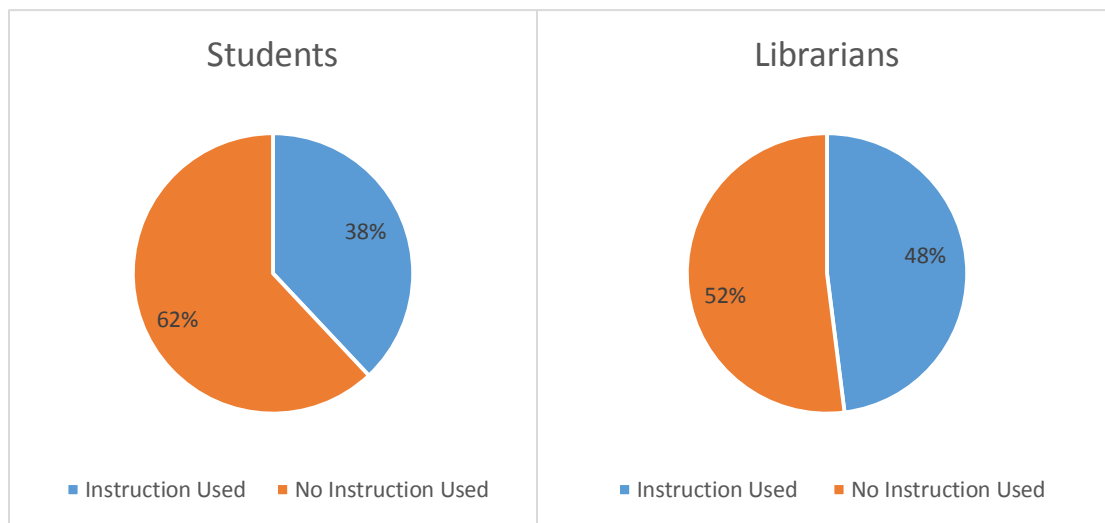
Instruction

In addition to the reference interview, another basic tenet of reference service is that it is best to instruct the user while answering the question. Rather than just providing the answer, the librarian or student assistant should try to teach the user how to find the answer. Though the authors believe there are questions for which this is not desirable, it is generally a practice that is encouraged. If chat providers can teach a student how to get to a particular resource or how to better search a database so that she might be able to do it on her own the next time, then that is what providers should try to do.

Thus, the authors rated each transaction for the presence or absence of instructional techniques. Options were A) *Not applicable/needed*; B) *No instructional techniques used*; and C) *Instruction techniques used*. In eighty-three of the 300 transcripts (close to 30 percent), it was felt that instruction was unnecessary. When those 83 transcripts are removed and only those transactions in which instruction techniques should have been used (Figure 3), are considered, librarians provide instruction 48% of the time and students 38% of the time. In previous studies, instruction levels seem to vary considerably across services. In a transcript analysis of Oregon's collaborative statewide chat service, 31.7% of applicable transcripts contained instruction (Hyde & Tucker-Raymond, 2006). Other studies have found much higher rates. Zhou, Love, Norwood and Massia (2006) saw evidence of instruction in 65% of transcripts. Fuller and Dryden (2015) found that 81% of their transcripts contained instruction, and only 4% did not contain instruction

when it was needed. But as in the case of the reference interview, the authors did not rate the quality of the instruction, just whether there was evidence of an instructional element. They did, however, certainly notice variation in the quality of instruction as transcripts were reviewed.

Figure 3
Presence or Absence of Instructional Techniques, Excluding Not Applicable/Needed



The authors discovered that a few of the chat providers were especially adept at offering instructional tips or explanations in their transactions. In one case, the chat reference patron had a citation for an article and asked for assistance locating the full text of the article. The librarian sent the user the link to the article and then followed up with “Would you like me to let you know how I found it?” The patron responded “Yes please!” Or in another transaction after the chat provider explained how he/she found a known item, the user said “OK great! Let me try that!”

Another commonly seen chat reference transaction type is a student asking for assistance looking for articles on a topic. An effective, indirect instruction practice that was identified was sending follow-up searching instruction after providing assistance. The provider might send a link to a database results list of articles for the student to review, and then send a brief message sharing which search terms were used or perhaps explaining which limit or facet was selected. After one chat provider explained the use of a wildcard character in searching (Puerto ric* would search rico and rican), the user replied, "That's a good tip, I wouldn't ever have thought of that."

Though considered a best practice to offer instruction during a transaction, users do not always want to be instructed, and in these cases, BGSU chat providers were not encouraged to force instruction upon them. However, the authors found evidence in transcripts that users wanted additional instruction. Statements such as "Thank you... Now how can I do that for any other journal?" or "How could I have found it? I was searching a good bit" or "Awesome. How did you find that out by the way?" It was not uncommon for chat users to ask for instruction when not given. Previous studies have also found that chat users are open to receiving instruction.

Devlin, Currie, and Straton's (2008) analysis of transcripts identified that most users were receptive of instruction when offered, and two surveys conducted by Graves and Desai (2006) found that 90% of their respondents were open to instruction during chat reference transactions and that 50% had specifically asked for instruction.

Maintaining Contact/Keeping Patron Informed and Building Rapport

Keeping chat patrons regularly informed of a provider's actions is a commonly accepted best practice. After removing transcripts for which this practice was judged unnecessary (about 30%), the numbers (Table 4) show that 95% of librarian transcripts and 88% of student assistant

transcripts used this technique. Though librarians outperformed student assistants, students are generally adept at this practice.

Table 4

Keeps Patron Informed of Actions, Excluding Transactions in which Keeping Patrons Informed of Actions was Unnecessary

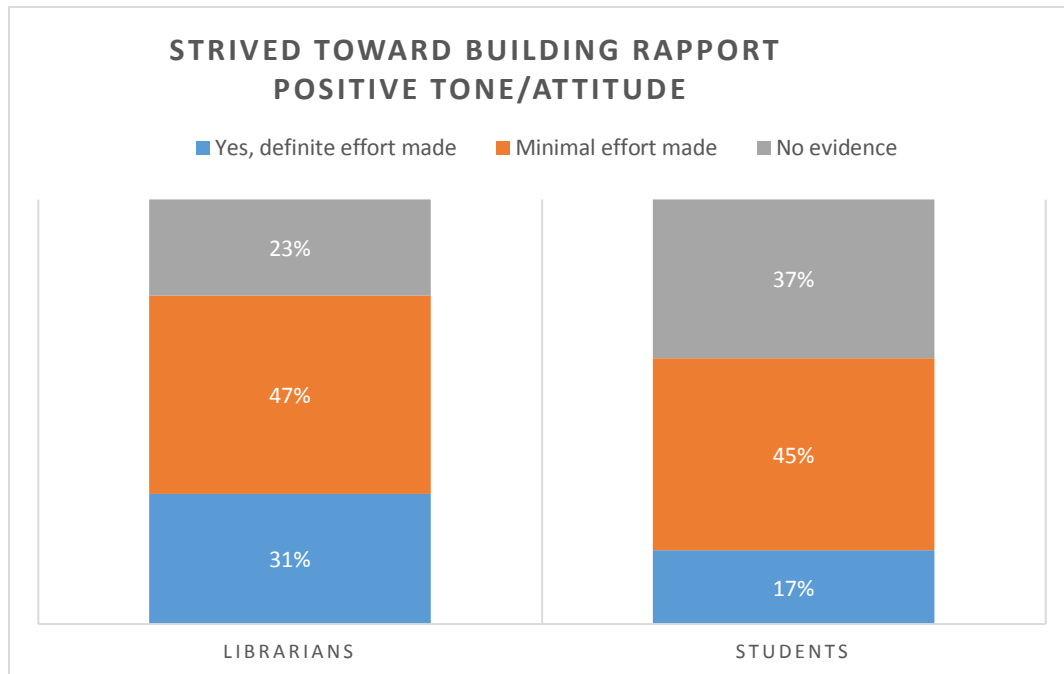
	Librarians	Students
No evidence & it would have improved transaction	5 (5%)	12 (12%)
Yes	102 (95%)	91 (88%)

Commendable techniques include statements such as the following:

- This is trickier than I thought, but I'm still looking!
- Please be patient! I'm helping someone else too but will get right back to you!
- I'm going to try searching for your terms in JSTOR now.
- I have a student at my desk now so there may be a delay in my response time

In a chat environment where visual cues and voice tone are not present, it is challenging, yet very important, to convey a welcoming, helpful presence. The authors rated each transcript on the provider's effort to build rapport and bring a positive tone and attitude to the interaction. The options were 1) *No evidence*, 2) *Minimal effort made*, and 3) *Yes, definite effort made*. As shown in Figure 4, 78% of librarians and 62% of students were rated as making at least a minimal effort at building rapport and conveying a positive tone.

Figure 4
Strived Toward Building Rapport. Positive Tone/Attitude



While rating the transcripts, the authors also found that judging whether effort was made to build rapport and convey a positive tone was often difficult. This question was more subjective than most and challenging for the authors to stay consistent. This is further complicated by the individualistic nature of the users, as not all would judge the friendliness of an interaction in the same way. Some providers like to use exclamation marks or smiley faces to help convey friendliness. One of the student assistants regularly used the greeting “Howdy!” or the phrase “Cool Beans.” But those techniques do not work for all of providers, and users respond differently to such sentiments as well. The difficulty in identifying common understanding of how to build rapport was also identified by Waugh (2013) who conducted semi-structured interviews with five 17-25 year old university students and found that informality in chat

reference made providers seem friendlier, but provider formality was positively associated with competence. Ultimately, the preferences of the interviewed students were divided, three of the students in the study preferred the formal approach and two preferred an informal communication style.

The art of conveying friendliness in a textual environment seems to be intuitive for many chat providers and more challenging for others. From examining all of the transcripts, it came to light that one of the easiest and most natural ways to build rapport is with a greeting that offers the provider's name. *Hello, this is Lisa. How can I assist you today?* This is a straightforward method that all providers can easily employ, and there is evidence that many users respond positively to this type of greeting.

Though the authors acknowledge the inherent subjectivity in rating whether a provider built rapport or a positive tone, it is still noteworthy that librarians outperformed student assistants by 16 percentage points (78% to 62%).

Completeness and Correctness

In this analysis, the authors recorded whether the chat provider's answer was complete, incomplete, or incomplete because of an abrupt ending. Of the 300 total transcripts, 24 transcripts, or 8 percent, ended abruptly and were unable to be completed. Though it is unknown why these abrupt endings occurred, there were likely a combination of reasons including that the user chose to end the transaction in that manner or that technology failed in some way.

Table 5 shows the summary of the remaining 276 transactions that came to a natural conclusion. Of those, librarians gave complete answers 82% of the time and student desk assistants 77%, librarians outperforming student assistants by a 5 percent margin.

Table 5
Completeness of Answer, Excluding Chats that Ended Abruptly

	Librarians	Students
Yes, complete	112 (82%)	107 (77%)
No, answer incomplete	25 (18%)	32 (23%)

How did the authors define an incomplete answer? And did the providers realize they were giving incomplete answers? In some transactions, there were multi-part questions and not all parts were addressed. In other cases, the providers offered a starting point but did not follow through to be sure the user was able to find the needed information. In these scenarios, the authors speculate that most were an unintentional oversight by the provider, but perhaps others could have been intentional. Perhaps the provider did not fully understand the extent of the question or was not confident in how to find the answer. Another variable potentially responsible for incomplete answers, was how busy the provider was with other users at the time. The provider could have been multitasking, assisting other users at the desk or trying to answer multiple chat questions simultaneously, and unable to devote his or her complete attention to one chat transaction. The following transcript demonstrates how a busy reference desk can negatively affect the quality of service.

Guest: Hi, I'm searching for an article on globalization and its impact on international food culture. I need about 7 articles, but I'm just having a little trouble getting started.

Library Staff: Hi. We are helping other patrons. Would it be possible for you to try this again in 10 min.?

Guest: Yep!

Library Staff: Thank you!

Ten minutes later...

Guest: Hi, I'm searching for an article on globalization and its impact on international food culture. I need about 7 articles, but I'm just having a little trouble getting started.

Ten minutes later...

Guest: Hi, I'm searching for an article on globalization and its impact on international food culture. I need about 7 articles, but I'm just having a little trouble getting started.

Forty-five minutes later...

Library Staff: Sorry. We got really busy here. Are you still there?

In addition to being complete, perhaps the ultimate test of a quality chat transaction is whether or not the answer is correct. Previous studies of chat transcripts have found various levels of correct answers. Most recently, Fuller and Dryden (2015) found that 93% of transcripts contain correct answers. Similarly, Arnold and Kaske (2005) identified that 91.72% of transcripts analyzed provided correct answers. Maximiek, Rushton, and Brown (2010) identified a lower number of 84% of transcripts that were both complete and correct. At times in this study, determining correctness was difficult. The authors did have the option to rank a transaction as “cannot discern” but probably tended to rank as “Yes, answer was correct” at times when not 100 percent sure that it was. On the flip side, when rating the correctness of a transaction as “No, answer was

incorrect” or “Answer was partially correct & partially incorrect” the authors were certain that it was at least partially erroneous.

Of the 300 analyzed transactions, the authors rated 28 of them as “cannot discern.” The results of the remaining 272 transactions are detailed in Table 6. Librarians outperformed the student assistants in the correctness of answers, 87 percent to 75 percent. Twenty-six student assistant transcripts and sixteen librarian transcripts were judged to be partially correct and partially incorrect, and in these instances the main part of the question was answered correctly, but there was an incorrect element in the answer. When the main part of the question was incorrect, it was recorded as “No, answer was incorrect.” Just one percent (2 transcripts) of librarian answers and 5 percent (7 transcripts) of student assistants were judged to be totally incorrect.

Table 6

Correctness of Answer, Excluding Transactions that were Indiscernible

	Librarians	Students
Yes, answer was correct	122 (87%)	99 (75%)
Answer was partially correct & partially incorrect	16 (11%)	26 (20%)
No, answer was incorrect	2 (1%)	7 (5%)

There was a definite difference between librarians and student desk assistants on the correctness of answers. Twenty-five percent of discernable answers offered by students were incorrect (5%) or partially incorrect (20%), compared to 12% for librarians, incorrect (1%) or partially incorrect (11%). The alarming discovery that twenty-five percent of the student assistants’ answers were at least partly incorrect prompted a closer look at the incorrect student transcripts. Cross analysis of the incorrect transcripts with the transaction types (directional, technical, etc.) revealed that the student assistants had a significant problem with locating known items. Student assistants

were incorrect or partially incorrect 38 percent of the time for known items. This is a clear indication that student assistants were not as successful at finding known items as librarians. Transcripts showed that in some cases student assistants stopped looking after checking in one place, such as the discovery layer service Summon.

Referrals

Chat patrons are sometimes best served when referred to another service point or to someone with a particular expertise. The authors looked for the presence or absence of a referral in each transaction and also judged the appropriateness of the referral decision. In 70% of all transactions, referrals were not given by chat providers and were also judged by the raters to be unnecessary. Of the remaining 30 percent (89 transactions) where referrals were needed, librarians did so appropriately 80% of the time but students only did so appropriately 53% of the time (see Table 7). These results are in contrast to Fuller and Dryden (2015) who found that only 2% of reviewed transcripts did not contain a referral when necessary.

Table 7
Presence/Absence of Referral, Excluding Transactions where Referral was not Necessary

	Librarians	Students
Referral not given but should have been	9 (20%)	17 (38%)
Referral given, but inappropriate	0 (0%)	4 (9%)
Referral given appropriately	35 (80%)	24 (53%)

This finding also indicated a problem with the student assistants. When a referral was warranted, student assistants either made an inappropriate referral or did not make one at all in 47 percent of the cases. Student assistants making appropriate referrals to librarians is a key component of the library's entire reference model, so this was yet another area of concern.

It was surprising to the authors that they judged 30 percent of the chat transactions as requiring a referral. This seemed high. Where were the chat providers referring users? In some instances, providers answered most (or at least part) of the question, but then made a referral (or should have made a referral) for a second part of the question or for an “in case more is needed” situation.

A significant number of the referrals (17 of 59) were made to the circulation desk, offering a phone number as they did not staff their own chat service. Fortunately, the circulation staff is in the process of implementing their own chat queue, which will allow chat reference providers to easily transfer questions involving patron records, renewals, and fines. This will be more user-friendly to chat patrons than providing the patron with a phone number to call the circulation desk. Table 8 details referrals made to destinations other than the circulation desk.

Table 8
Referral Destinations

	Number
Special Collections	7
Learning Commons (writing or tutoring assistance)	6
Specific subject specialist librarian	5
Schedule a research appointment with a librarian	5
Come back when a librarian is available (ex. the following day)	5
Various offices on campus	3
Technical support staff	3
Local public library	2
Interlibrary loan	2
Other	4

Patron Closing Comments and Raters Overall Impressions

The authors were pleased to discover that chat patrons were very happy with the service they received! Of the 300 transactions analyzed, 227 patrons expressed thanks or a positive comment and there was not a single negative comment (Table 9). Did they seem to prefer the assistance

given by librarians over students? Student assistants were more likely to receive a thank you or positive comment (A or B), 81 percent, versus librarians at 70 percent. However, if only the substantial positive comments are considered, librarians were more likely than student assistants to receive this commendation, 41 percent for librarians versus 34 percent for student assistants.

Table 9

Patron Expressed Positive Reaction to Session

	Librarians	Students
Yes, positive comment expressed	62 (41%)	51 (34%)
A simple thank you expressed	44 (29%)	71 (47%)
Neutral. No reaction expressed	44 (29%)	28 (19%)
No, the patron expressed a negative reaction	0 (0%)	0 (0%)

Positive comments included the following:

- OMG that worked. Thank you!!!! I really appreciate it!
- OK thanks for your help. This is awesome BTW.
- These sources are great. Thank you so much for your time and help.

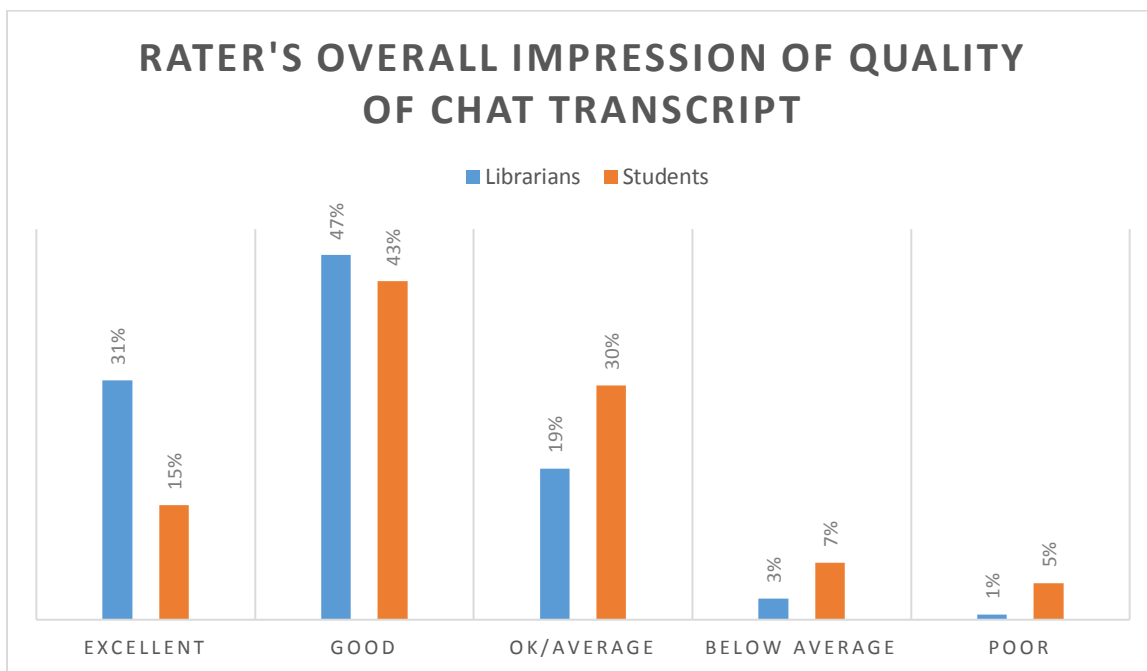
As evidenced in the analysis, chat patrons did not always receive stellar service. Chat providers sometimes gave incorrect or incomplete answers, they didn't always offer greetings or closings or build rapport, but yet not one user in this set of 300 transcripts expressed a negative reaction. Perhaps library users do not have high expectations of library service. As past reference studies have shown, library patrons rate chat reference service higher than their providers would anticipate (Hansen, Johnson, Norton, & McDonough, 2009) or than librarian evaluation indicates is warranted (Smyth & MacKenzie, 2006). Other transcript analyses have also reported very low levels of negative comments (Marsteller & Mizzy, 2003). Whatever the explanation, chat

reference users seem to be fairly equally pleased with the service provided by librarians and student assistants.

For the final question, the authors rated the transcript by overall impression of the success and excellence of the transaction, not focusing on whether each individual indicator was met. Each transcript was rated as *Poor*, *Below Average*, *OK/Average*, *Good* or *Excellent*. Thus, a transaction did not necessarily have to have every single best practice element in order to earn an *Excellent* rating.

Librarians performed higher in this category than student assistants. Seventy-eight percent of librarian transcripts received Good or Excellent ratings compared to just fifty-eight percent of student transcripts. (Figure 5) The biggest difference is in the top category where 46 librarian transcripts and just 22 student transcripts received an excellent rating.

Figure 5
Rater's Overall Impression of Quality of Chat Transcript



The authors were not surprised to find that librarian transcripts rated higher than student assistant transcripts. However, it is interesting that this result did not seem to correspond with the results in the previous question, the patron's expression of thanks. The chat users more frequently expressed an appreciation of thanks to student assistants than they did to librarians (121 to 106), but yet the authors rated the librarians higher. As librarians, do the authors just better understand and appreciate good chat reference and instruction service? And perhaps users don't know what they are missing, but were rather just happy with what they were given? Would students rate the transcripts differently than librarians did? Professional librarians should be better judges of an exceptional transaction, but maybe users do not want or need all that they offer. The authors also do acknowledge that an expression of thanks is not a direct indicator of satisfaction.

Initial Time to Answer and Word Count

In addition to the rubric analysis, the authors also analyzed initial time to answer and word count. It was posited that student assistants might be likely to answer chats more quickly than librarians, but this was not the case. Previous studies have found mean hold times between 41.5 seconds (Richardson, 2002) and 52.9 (Harmeyer, 2007). In this sample, the mean time for a librarian to respond to chats was 42.8 seconds versus a mean initial response time of 44.3 seconds for student assistants. The median time to answer was 27.5 seconds for librarians and 25 seconds for student assistants. Hold time does not differ substantially between librarians and students in this study, although the skewed distribution evidenced by the difference between the mean to median response time indicates that some patrons wait longer than ideal. The authors plan to investigate methods to minimize long waits for an initial response.

Librarians were more likely to have longer transcripts than student assistants. Among this sample, the mean librarian transcript was 276 words while student assistant transcripts contained 203 words. Transcript length is a complicated measure as there is not necessarily a correlation between transcript length and chat performance, and users have stated preferences for shorter transactions (Kitzie and Shah, 2012). Also, librarians might be more likely to pick up chats where the initial query indicates a complicated question or shorter transactions could stem from dropped chats. Ultimately, the authors decided that the impact of transcript length on the quality of chat reference may be a useful area for future research but is beyond the scope of the current project.

Conclusion and Recommendations

In almost all measures of comparison, reference librarians outperformed student information desk assistants in providing quality chat reference service. The components of reference service where librarians particularly excelled over student assistants were in identifying known items and providing referrals. If providing the highest quality chat service possible was the only consideration when making staffing decisions, then librarians and not student assistants should be answering chat reference questions at all times. However, the BGSU chat service is currently staffed for 80 hours per week, and it simply would not be feasible for reference librarians alone to staff the service for that many hours. Do the weaknesses uncovered in the student assistants' service warrant decreasing the hours the chat reference service is available? Several concerns with student service were noted in the discussion above, but by many measures, the librarians did not outperform the student assistants by a meaningful margin, and the student desk assistants demonstrated that they are capable of offering quality assistance to users. *Student assistants*

successfully assisted chat users in 88 percent of their transactions, and they received more expressions of appreciation from chat users than librarians received. And with adjustments, the authors believe that student desk assistants can improve on identified weaknesses and provide an even higher level of chat reference assistance.

The authors believe that student information desk assistants can improve upon their chat reference skills and have thus implemented major changes to the student training program.

Though student assistants generally performed well, there were also areas of real concern. The two biggest concerns were the number of incorrect or partially incorrect answers given and the absence of offering referrals when needed. Other studies of chat reference have also concluded that referral training is of primary importance (Mitchell, Comer, Starkey, & Francis, 2011). The need for improvement was clear, and the authors have taken steps to remedy the problems through a major revamp to the student training program. In addition to student employee training completed upon hire, student information desk assistants now participate in an ongoing training program (attendance mandatory), meeting as a group every two to three weeks throughout the academic year.

The following training sessions were developed based on needs identified from this study: (1) Making Referrals to Librarians, (2) Chat Reference: Best Practices & Transcript Analysis, (3) Finding Known Items, and (4) Referrals to Special Collections and other Service Areas. The known item training focused heavily on looking beyond one location for an item, particularly when using the library's discovery layer, referring complicated known items, and incorporating interlibrary loan services. Chat reference training focused on discussing the findings of this transcript analysis, providing training in general reference best practices, and challenging

students to evaluate selected transcripts. Components of the referral training included: librarians coming to a training meeting to talk about their areas of expertise; discussing scenarios where referrals are needed, keeping librarian business cards stocked at the service desk for easy in-person referrals; and visiting areas in the library to learn more about places to which referrals could be made. The authors are also working to strengthen relationships that students have with librarians as they have anecdotally observed this to increase a student assistant's willingness to ask for assistance or make referrals. BGSU Libraries has an intricate system of services and organization, so it was necessary to increase the student assistants' understanding of the services offered throughout the building.

Additionally, using what was learned from analysis, the authors have instituted the following general changes to the BGSU chat reference service for all reference desk staff.

Since chat reference questions are increasingly complex and librarians provide a higher quality service than student assistants, librarians should be the initial responder to chat reference questions when both a librarian and student assistant are staffing the service.

Though it is not feasible for librarians to staff the library's chat reference service for all hours that are currently being offered, librarians can be the primary responder to chat reference questions when they are staffing the Research and Information Desk. This should result in higher quality service for more hours of operation.

The authors believe that greetings are critical in adding a personal element and building rapport with the chat user and have instituted a standard greeting as a result.

A greeting is a best practice in the chat environment as visual and vocal clues are not present, and the authors have stressed this to all chat providers. The required standard greetings now include the name and status of the library staff member answering the chat.

- Hello, this is Carol, a reference and instruction librarian. How can I assist you today?
- Hi, this is Kelly, a graduate assistant in the library. Let me take a look for you.
- Hi, this is Jackie, a student information desk assistant in the library. How can I help you?

As chat users might have different expectations in the quality and depth of answers provided by student staff and librarians, communicating the status level in the greeting avoids misleading the chat user into thinking that a librarian is always responding. This practice is especially beneficial when the questioner is an advanced researcher whose need might require more knowledge or skill than a student possesses. Chat patrons now frequently use the provider's name when replying during a chat interaction, which is an indicator that they may like and appreciate it.

It is important to offer a closing statement and to gather user feedback, so the authors have added a standard closing to be used in all substantive transactions to accomplish both.

For the purposes of this study, analysis of user satisfaction was an "expression of thanks".

However, this has limitations as it assumes that the user was truly satisfied and not simply being polite. Following an initial transcript evaluation project in 2013, BGSU chat providers began using a survey to gather feedback from users and have recently implemented a standardized closing that incorporates the survey link.

“Thank you for using our Chat with a Librarian service! We welcome your input on this brief survey. < URL>”

Adding this standard closing will be an improvement, but chat providers also need to improve upon follow-ups within the closings, which is more difficult when using a standardized closing format. A strong closing that confirms with the user that their question has been answered is a staple of reference service that has long been included as a predictive factor of reference accuracy. Gers and Seward (1985) recommended that every reference transaction include a follow up inquiring if the question has been answered. In the chat environment, not all transactions can include follow up because of drop-offs, but follow-up upon closing was only present in 31% of librarian transcripts and 25% of student assistant transcripts indicating a large potential for improvement.

It is critically important that the reference coordinator and librarians more closely monitor the work of the student information desk assistants and correct problems when they occur.

All chat transcripts are copied and pasted into a reference statistics database immediately upon completion. The Reference Coordinator and several others semi-regularly monitor the statistics log for problematic answers. Undoubtedly some of these incorrect responses were noted at the time and discussed with the chat provider (student or librarian), but these numbers warrant a renewed commitment to monitoring and correcting these problems as they occur. The Reference Coordinator and Library Associate (student supervisor) have increased monitoring of the statistics/question log and work to correct problem situations with student assistants.

Making assumptions about a user's need is not good practice. Both librarians and students need to do a better job of conducting a reference interview and providing instruction in the chat environment.

Librarians were slightly more likely to conduct a reference interview when the transaction might have benefited from it (See Table 6). These results were somewhat surprising. The authors expected librarians to be significantly more likely than student assistants to conduct reference interviews. As Table 6 indicates, in 30 percent of the transactions in which an interview was needed, the librarian did not ask clarifying questions. The student assistants were even more likely (37 percent) not to negotiate the question. In the future, the authors hope to provide additional training for all service providers regarding reference interviews. Instances of instruction were also low in comparison to several of the other transcript analysis studies discussed earlier. The authors shared this finding with reference librarians and scheduled time in a reference meeting to review methods for incorporating instruction into the chat environment.

In conclusion, the authors transcript analysis found that at BGSU, librarians did perform better than undergraduate students in the provision of chat reference service. However, the difference is less substantial than originally anticipated. With proper training, undergraduate student assistants can and do provide quality reference service in the chat environment and are a valuable part of this library's chat reference service. BGSU libraries will continue to use students in this capacity, with the addition of increased and consistent transcript assessment to identify areas where student providers need further instruction and practice. Student assistants add a vital

component to this popular chat reference service, providing library research assistance for far more hours than librarians alone would be able to provide.

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